Center Independent Research & Development: JPL IRAD

Demonstration of Interferometric SAR Onboard Processing for Planetary Mapping Missions

Completed Technology Project (2013 - 2016)

Project Introduction

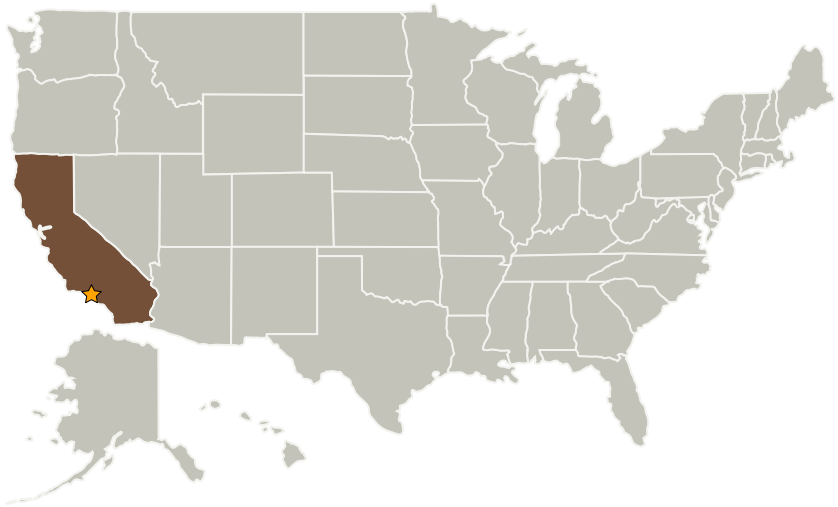
This task is developing new method for reducing onboard data by using self focusing and fully processing the images within the instrument itself, thereby reducing the burden on the spacecraft and the downlink network by orders of magnitude.

This task will enable future planetary mapping missions through a technique called interferometric synthetic aperture radar, using microwave and triangulation to create very high precision maps of extra- terrestrial bodies by orbiting spacecraft. One of the key challenges of any mapping mission is the amount of data generated by the spacecraft, and the difficulty of returning that data to earth. This task will develop new methods to reduce data processing onboard the spacecraft by using self focusing and fully processing the images within the instrument itself, thereby reducing the burden on the spacecraft and the down link network by orders of magnitude. This can significantly reduce mission duration and thus mission cost, enabling these mapping techniques for planetary bodies.

Anticipated Benefits

Enables new instrument concepts for planetary and earth missions

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations
California

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Center Independent Research & Development: JPL IRAD

Project Management

Program Manager:

Fred Y Hadaegh

Project Manager:

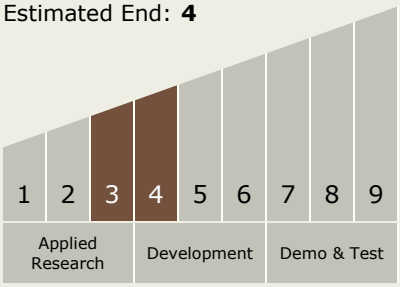
Jonas Zmuidzinas

Principal Investigator:

Brian D Pollard

Technology Maturity (TRL)

Start: **3**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves